## SPEC® CPU2017 Floating Point Speed Result

### Dell Inc.

**PowerEdge R340 (Intel Xeon E-2124)**

### SPECspeed2017_fp_base = 23.7

### SPECspeed2017_fp_peak = 22.4

<table>
<thead>
<tr>
<th>Threads</th>
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<th>SPECspeed2017_fp_peak (22.4)</th>
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<tbody>
<tr>
<td>603.bwaves_s</td>
<td>4</td>
<td>79.9</td>
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<tr>
<td>607.cactuBSSN_s</td>
<td>4</td>
<td>37.8</td>
</tr>
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<td>619.lbm_s</td>
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<td>621.wrf_s</td>
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<td>627.cam4_s</td>
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<tr>
<td>628.pop2_s</td>
<td>4</td>
<td>28.6</td>
</tr>
<tr>
<td>638.imagick_s</td>
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<td>644.nab_s</td>
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</tr>
<tr>
<td>649.fotonik3d_s</td>
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</tr>
<tr>
<td>654.roms_s</td>
<td>4</td>
<td>15.5</td>
</tr>
</tbody>
</table>

### Hardware

- **CPU Name**: Intel Xeon E-2124
- **Max MHz.**: 4300
- **Nominal**: 3300
- **Enabled**: 4 cores, 1 chip
- **Orderable**: 1 chip
- **Cache L1**: 32 KB I + 32 KB D on chip per core
- **L2**: 256 KB I+D on chip per core
- **L3**: 8 MB I+D on chip per chip
- **Memory**: 64 GB (4 x 16 GB 2Rx8 PC4-2666V-R)
- **Storage**: 1 x 960 GB SATA SSD
- **Other**: None

### Software

- **OS**: SUSE Linux Enterprise Server 12 SP3 4.4.126-94.22-default
- **Compiler**: C/C++: Version 18.0.2.20180210 of Intel C/C++ Compiler for Linux; Fortran: Version 18.0.2.20180210 of Intel Fortran Compiler for Linux
- **Parallel**: Yes
- **Firmware**: Version 1.0.1 released Oct-2018
- **File System**: xfs
- **System State**: Run level 3 (multi-user)
- **Base Pointers**: 64-bit
- **Peak Pointers**: 64-bit
- **Other**: None
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Dell Inc.  
PowerEdge R340 (Intel Xeon E-2124)

**SPECspeed2017_fp_base = 23.7**  
**SPECspeed2017_fp_peak = 22.4**

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<th>Seconds</th>
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<th>Seconds</th>
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<td>15.8</td>
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</tr>
</tbody>
</table>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

**Operating System Notes**

Stack size set to unlimited using "ulimit -s unlimited"

**General Notes**

Environment variables set by runcpu before the start of the run:

```
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-32:/home/cpu2017/je5.0.1-64"
OMP_STACKSIZE = "192M"
```

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM memory using Redhat Enterprise Linux 7.4

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.

Transparent Huge Pages enabled by default

Prior to runcpu invocation

Filesystem page cache synced and cleared with:

```
sync; echo 3>/proc/sys/vm/drop_caches
```

**Platform Notes**

BIOS settings:

Virtualization Technology disabled

System Profile set to Custom

(Continued on next page)
Dell Inc.

PowerEdge R340 (Intel Xeon E-2124)

SPECspeed2017_fp_base = 23.7
SPECspeed2017_fp_peak = 22.4

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Mar-2019
Hardware Availability: Dec-2018
Software Availability: Apr-2018

Platform Notes (Continued)

CPU Performance set to Maximum Performance
C States set to Autonomous
C1E disabled
Uncore Frequency set to Dynamic
Energy Efficiency Policy set to Performance
Memory Patrol Scrub disabled
CPU Interconnect Bus Link Power Management disabled
PCI ASPM L1 Link Power Management disabled
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-bx7m Wed Mar 13 10:19:31 2019

SUT (System Under Test) info as seen by some common utilities.
For more information on this section, see
https://www.spec.org/cpu2017/Docs/config.html#sysinfo

From /proc/cpuinfo
model name : Intel(R) Xeon(R) E-2124 CPU @ 3.30GHz
  1 "physical id"s (chips)
  4 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The following
excerpts from /proc/cpuinfo might not be reliable. Use with caution.)
cpu cores : 4
siblings : 4
physical 0: cores 0 1 2 3

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 4
On-line CPU(s) list: 0-3
Thread(s) per core: 1
Core(s) per socket: 4
Socket(s): 1
NUMA node(s): 1
Vendor ID: GenuineIntel
CPU family: 6
Model: 158
Model name: Intel(R) Xeon(R) E-2124 CPU @ 3.30GHz
Stepping: 10
CPU MHz: 4252.799
CPU max MHz: 4300.0000
CPU min MHz: 800.0000
BogoMIPS: 6623.99
Virtualization: VT-x
L1d cache: 32K

(Continued on next page)
Dell Inc.  
PowerEdge R340 (Intel Xeon E-2124)

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Platform Notes (Continued)

L1i cache: 32K
L2 cache: 256K
L3 cache: 8192K
NUMA node0 CPU(s): 0-3

Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse3 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant_tsc art arch_perfmon pebs bts rep_good ntop xtopology nonstop_tsc aperfmpref perfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbog fma cx16 xtpr pdcm pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epb invpcid_single pni dtes64_64bit_model like cpl flushbyt perfctr_cpuid mcm cflisol arch_perfctr

/cache/data

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.

Free: 1 nodes (0)
node 0 cpus: 0 1 2 3
node 0 size: 64278 MB
node 0 free: 55758 MB
node distances:
node 0
  0: 10

From /proc/meminfo

MemTotal: 65820840 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/usr/bin/lsb_release -d

SUSE Linux Enterprise Server 12 SP3

From /etc/*release*/etc/*version*/

SUSE-release:
SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 3
# This file is deprecated and will be removed in a future service pack or release.
# Please check /etc/os-release for details about this release.

os-release:
NAME="SLES"
VERSION="12-SP3"
VERSION_ID="12.3"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP3"

(Continued on next page)
**Dell Inc.**

**PowerEdge R340 (Intel Xeon E-2124)**

<table>
<thead>
<tr>
<th>SPECspeed2017_fp_base</th>
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**Platform Notes (Continued)**

```plaintext
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp3"

uname -a:
   Linux linux-bx7m 4.4.126-94.22-default #1 SMP Wed Apr 11 07:45:03 UTC 2018 (9649989)
   x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2017-5754 (Meltdown): Mitigation: PTI
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: IBRS+IBPB

run-level 3 Mar 13 05:10 last=5

SPEC is set to: /home/cpu2017
```

---

**Compiler Version Notes**

```
-----------------------------------------------------------------------------------------------
  CC  619.lbm_s(base) 638.imagick_s(base) 644.nab_s(base)
-----------------------------------------------------------------------------------------------
icc (ICC) 18.0.2 20180210
  Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
-----------------------------------------------------------------------------------------------
```

---

```
-----------------------------------------------------------------------------------------------
  CC  619.lbm_s(peak) 638.imagick_s(peak) 644.nab_s(peak)
-----------------------------------------------------------------------------------------------
icc (ICC) 18.0.2 20180210
  Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
-----------------------------------------------------------------------------------------------
```
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CPU2017 License: 55
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Compiler Version Notes (Continued)

FC 607.cactuBSSN_s(base)
-----------------------------------------------
icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

FC 607.cactuBSSN_s(peak)
-----------------------------------------------
icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

FC 603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)
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ifort (IFORT) 18.0.2 20180210
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FC 603.bwaves_s(peak) 649.fotonik3d_s(peak) 654.roms_s(peak)
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CC 621.wrf_s(peak) 627.cam4_s(peak) 628.pop2_s(peak)

ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

Fortran benchmarks:
ifort -m64

Benchmarks using both Fortran and C:
ifort -m64 icc -m64 -std=c11

Benchmarks using Fortran, C, and C++:
icpc -m64 icc -m64 -std=c11 ifort -m64

Base Portability Flags

603.bwaves_s: -DSPEC_LP64
607.cactuBSSN_s: -DSPEC_LP64
619.lbm_s: -DSPEC_LP64
621.wrf_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
627.cam4_s: -DSPEC_LP64 -DSPEC_CASE_FLAG
628.pop2_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
-assume byterecl
638.imagick_s: -DSPEC_LP64
644.nab_s: -DSPEC_LP64
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP

(Continued on next page)
### Base Optimization Flags (Continued)

**Fortran benchmarks:**
-DSPEC_OPENMP -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp
-nostandard-realloc-lhs

**Benchmarks using both Fortran and C:**
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
- qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs

**Benchmarks using Fortran, C, and C++:**
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
- qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs

### Peak Compiler Invocation

**C benchmarks:**
```
icc -m64 -std=c11
```

**Fortran benchmarks:**
```
ifort -m64
```

**Benchmarks using both Fortran and C:**
```
ifort -m64 icc -m64 -std=c11
```

**Benchmarks using Fortran, C, and C++:**
```
icpc -m64 icc -m64 -std=c11 ifort -m64
```

### Peak Portability Flags

Same as Base Portability Flags

### Peak Optimization Flags

**C benchmarks:**
```
-prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX2 -qopt-prefetch
-ipo -O3 -ffinite-math-only -no-prec-div -qopt-mem-layout-trans=3
```

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**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
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**Peak Optimization Flags (Continued)**

C benchmarks (continued):
- `-DSPEC_SUPPRESS_OPENMP` `-qopenmp` `-DSPEC_OPENMP`

Fortran benchmarks:
- `-prof-gen(pass 1)` `-prof-use(pass 2)` `-DSPEC_SUPPRESS_OPENMP`
- `-DSPEC_OPENMP` `-O2` `-xCORE-AVX2` `-qopt-prefetch` `-ipo` `-O3`
- `-ffinite-math-only` `-no-prec-div` `-qopt-mem-layout-trans=3` `-qopenmp`
- `-nostandard-realloc-lhs`

For benchmarks using both Fortran and C:
- `-prof-gen(pass 1)` `-prof-use(pass 2)` `-O2` `-xCORE-AVX2` `-qopt-prefetch`
- `-ipo` `-O3` `-ffinite-math-only` `-no-prec-div` `-qopt-mem-layout-trans=3`
- `-DSPEC_SUPPRESS_OPENMP` `-qopenmp` `-DSPEC_OPENMP` `-nostandard-realloc-lhs`

For benchmarks using Fortran, C, and C++:
- `-prof-gen(pass 1)` `-prof-use(pass 2)` `-O2` `-xCORE-AVX2` `-qopt-prefetch`
- `-ipo` `-O3` `-ffinite-math-only` `-no-prec-div` `-qopt-mem-layout-trans=3`
- `-DSPEC_SUPPRESS_OPENMP` `-qopenmp` `-DSPEC_OPENMP` `-nostandard-realloc-lhs`

The flags files that were used to format this result can be browsed at:

You can also download the XML flags sources by saving the following links:

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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEC CPU2017 v1.0.5 on 2019-03-13 11:19:31-0400.  
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